

A proper *prima facie* case of obviousness requires that the cited references when combined must teach or suggest all the claim limitations, and that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references or to modify the reference teachings. See Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §706.02(j).

Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness in the §103(a) rejection of claims 1-17, 20-43 and 45-48, in that the cited references, even if assumed to be combinable, fail to teach or suggest all the claim limitations, and in that no cogent motivation has been identified for combining the references or modifying the reference teachings to reach the claimed invention.

Independent claim 1 is directed to a method of determining local multicast information of a local area network (LAN), and includes the steps of dividing the LAN to a number of segments larger than the number of virtual LANs (VLANs) in the network, and creating a layer-3 multicast routing table, which relates to each of the segments separately.

The Examiner in formulating the §103(a) rejection acknowledges that Gleeson fails to disclose the claimed multicast routing table which relates to individual segments of a divided LAN as claimed, but argues that the multicast forwarding table in FIG. 4 of Virgile supplies the missing teachings. Applicants respectfully disagree. The FIG. 4 multicast forwarding table in Virgile does not relate separately to each of the segments of a divided LAN as claimed. Instead, the entries of the Virgile forwarding table correspond to different multicast groups. For example, table entry 230 “corresponds to the multicast group for an audio-video teleconference which has the address AV1 stored in the multicast destination address index field 232” (Virgile, column 8, lines 2-6). Thus, the multicast forwarding table relied on by the Examiner fails to relate separately to each of the segments of a particular LAN. The combined teachings of Gleeson and Virgile therefore fail to meet each and every limitation of independent claim 1.

Also, as indicated previously, the Examiner has failed to identify a cogent motivation for combining the Gleeson and Virgile references or modifying the reference teachings to reach the claimed invention.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination “must be based on objective evidence of record” and that “this precedent has been reinforced in myriad decisions, and cannot be dispensed with.” In re Sang-Su Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, the Federal Circuit has stated that “conclusory statements” by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved “on subjective belief and unknown authority.” Id. at 1343-1344. There has been no showing in the present § 103(a) rejection of objective evidence of record that would motivate one skilled in the art to combine the Gleeson and Virgile references to produce the particular limitations in question.

Instead, the Examiner states as follows in the Office Action at pages 2-3, regarding independent claim 1 and the proposed combination of the Gleeson and Virgile references, with emphasis supplied:

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include information from a multicasting table of the LAN segments as disclosed by Virgile in the VLAN table disclosed by Gleeson et al. One would have been motivated to do this because if the network configuration was to change, it would be reflected in the table, and the router would not have to send packets to a destination that no longer existed, making the system more efficient.

Applicants submit that this statement is a subjective and conclusory statement of obviousness, and insufficient to support the proposed combination of the reference teachings. Also, as indicated previously, the multicast forwarding table in FIG. 4 of Virgile, relied on by the Examiner, does not relate separately to segments of a divided LAN, and thus actually represents a teaching away from the claimed invention.

It therefore appears that the Examiner in formulating the § 103(a) rejection of independent claim 1 over Gleeson and Virgile has undertaken a piecemeal reconstruction of the claimed invention based upon impermissible hindsight, given the benefit of the disclosure provided by Applicants.

Independent claim 14 is directed to a method of forwarding multicast packets by a layer-3 switch, and includes the steps of receiving a multicast packet by the switch through a first physical port on a first VLAN, and routing the multicast packet in layer-3 out a second physical port of the switch, on the first VLAN. The claim further recites that the multicast packet is bridged in layer-2 through a third physical port of the layer-3 switch.

The Examiner in formulating the §103(a) rejection of claim 14 initially appears to argue that the multicast network device (MND) 226 in FIG. 2A of Gleeson corresponds to the claimed layer-3 switch. The Examiner then goes on to state that intermediate device 221 in FIG. 2A of Gleeson can be considered a layer-2 device, and that it can receive a multicast packet through port 4. This suggests that the Examiner is misinterpreting the claim language. The claim, as indicated above, calls for a layer-3 switch in which routing and bridging occur through certain ports of that switch. Thus, the functions attributed by the Examiner to two different devices, namely MND 226 and intermediate device 221 (the latter of which the Examiner characterizes as a layer-2 device), cannot even if assumed appropriate meet the claim limitations relating to a layer-3 switch having first, second and third physical ports. The combined teachings of Gleeson and Virgile therefore fail to meet each and every limitation of independent claim 1.

Independent claim 20 is directed to a method of forwarding multicast packets within a single VLAN. The method includes the steps of receiving the multicast packets by a first switch connected to the VLAN, routing the multicast packets in layer-3 to a second switch connected to the VLAN, and routing the multicast packets in layer-3 by the second switch through an interface included in the VLAN.

The Examiner argues that the limitations of claim 20 are met by the arrangement of MND 226 and intermediate device 221 as shown in FIG. 2A of Gleeson. More specifically, the Examiner apparently argues that intermediate device 221 corresponds to the claimed “first switch” and that MND 226 corresponds to the claimed “second switch.” However, even if one assumes for purposes of argument that this characterization is correct, the final step of the claimed method is not met. That is, the Examiner has not demonstrated that MND 226 routes the multicast packets in layer-3 through an interface included in the same VLAN associated with the first switch and the second switch. It

is therefore believed that the combined teachings of Gleeson and Virgile fail to meet the limitations of independent claim 20.

Independent claim 23 is directed to a method of forwarding multicast packets within a single VLAN. The method includes the steps of receiving multicast packets of a specific destination address and source address by a first switch connected to the VLAN, routing the received multicast packets in layer-3, by the first switch, to at least one first host connected to the VLAN, receiving multicast packets of the specific destination address and source address by a second switch connected to the VLAN, and routing the multicast packets in layer-3, by the second switch, to at least one second host.

The Examiner in formulating the §103(a) rejection of claim 23 again apparently argues that the intermediate device 221 corresponds to the claimed “first switch” and that MND 226 corresponds to the claimed “second switch.” However, even if one assumes for purposes of argument that this characterization is correct, other limitations of the claimed method are not met. For example, the claimed routing of multicast packets in layer-3 by the second switch to at least one second host is not met by the relied-upon arrangement in Gleeson. It is therefore believed that the combined teachings of Gleeson and Virgile fail to meet the limitations of independent claim 23.

Independent claim 26 is directed to a switch comprising a plurality of ports, a layer-2 bridging unit which bridges packets between the ports responsive to their destination MAC address and their VLAN, and a multicast detector which identifies a group of at least some of the IP multicast routing related packets received by the switch, the group including IGMP queries, and prevents the layer-2 bridging unit from bridging the identified packets at least through ports which do not lead to at least one neighboring layer-3 switch or router.

The Examiner in formulating the §103(a) rejection of claim 26 relies on the MND 228 in FIG. 2A of Gleeson. However, the MND 228 is not described as comprising a layer-2 bridging unit and a multicast detector that operate in the particular manner set forth in the claim. It is therefore believed that the combined teachings of Gleeson and Virgile fail to meet the limitations of independent claim 26.

Independent claim 38 is directed to a layer-3 switch, comprising at least one VLAN interface which does not have an associated IP router interface, and a layer-3 output unit which directs IP

packets with a MAC source address of the switch through the at least one VLAN interface. The claim further specifies that specify that the layer-3 output unit directs packets through the at least one VLAN interface, with an IP source address associated with a different VLAN interface of the switch.

The Examiner in formulating the §103(a) rejection of claim 38 argues that the MND 226 is a type of layer-3 switch having a VLAN interface, without an associated IP router interface, and a layer-3 output unit as claimed. However, there is no teaching in Gleeson which indicates that the MND 226 is configured in this manner. The Examiner has therefore failed to demonstrate that Gleeson and Virgile meet the limitations of claim 38.

Independent claim 45 is directed to a method of forwarding packets, and includes the steps of receiving a packet with a source MAC address and a TTL value, changing the source MAC address of the received packet, and forwarding the packet with the changed MAC address but with the same TTL value.

The Examiner in rejecting claim 45 under §103(a) relies on FIG. 6, column 12, line 40, and column 13, lines 52-62, of Gleeson. However, the relied-upon portions fail to meet the claim limitation regarding changing a source MAC address but not the TTL value. Gleeson at column 13, lines 50-52, states as follows:

The controller 306 may perform conventional routing functions to the IP header field 404, such as decrementing a time-to-live (TTL) value (not shown).

The Examiner characterizes this teaching as allegedly disclosing the forwarding of a packet with a changed MAC address but with the same TTL value as claimed. However, the relied-upon passage does not imply that a packet will be forwarded without decrementing its TTL value. Instead, it simply states that the performance of conventional routing functions is optional. This is because the “may” in the relied-upon passage applies to the performance of conventional routing functions. Once a decision is made to configure the controller 306 to perform a conventional routing function, such as decrementing the TTL value, it will apparently always decrement that value, as would be expected in accordance with conventional practice. The relied-upon teachings thus not only fail to

meet the limitations in question, but actively teach away from them. The proposed combination of Gleeson and Virgile thus fails to meet the limitations of claim 45.

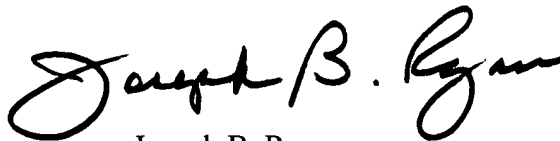
Independent claim 48 is directed to a switch comprising a plurality of ports, a layer-3 multicast routing table, which identifies interfaces to which multicast packets should be routed according to both a VLAN and a port, and a multicast routing unit which routes multicast packets between the ports of the switch based on entries of the multicast routing table.

The Examiner in formulating the §103(a) rejection of claim 48 relies on Gleeson and Virgile, but fails to provide any indication as to what portions of these references are alleged to meet the limitations of claim 48. Although the Examiner introduces an additional reference, U.S. Patent No. 6,625,685 (hereinafter "Oguchi"), in the rejection of dependent claim 49, that reference is apparently not applied to claim 48. The Examiner has failed to establish a proper *prima facie* case of obviousness of claim 48 over Gleeson and Virgile.

The dependent claims are believed allowable for at least the reasons identified above with regard to their respective independent claims. Moreover, certain of these dependent claims are believed to define additional separately-patentable subject matter relative to Gleeson, Virgile, Oguchi and the other art of record.

In view of the foregoing, Applicants respectfully submit that the claims are in condition for allowance, and request withdrawal of the §103(a) rejections.

Respectfully submitted,

A handwritten signature in black ink, reading "Joseph B. Ryan". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

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